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# SCIENCE NEWS LETTER

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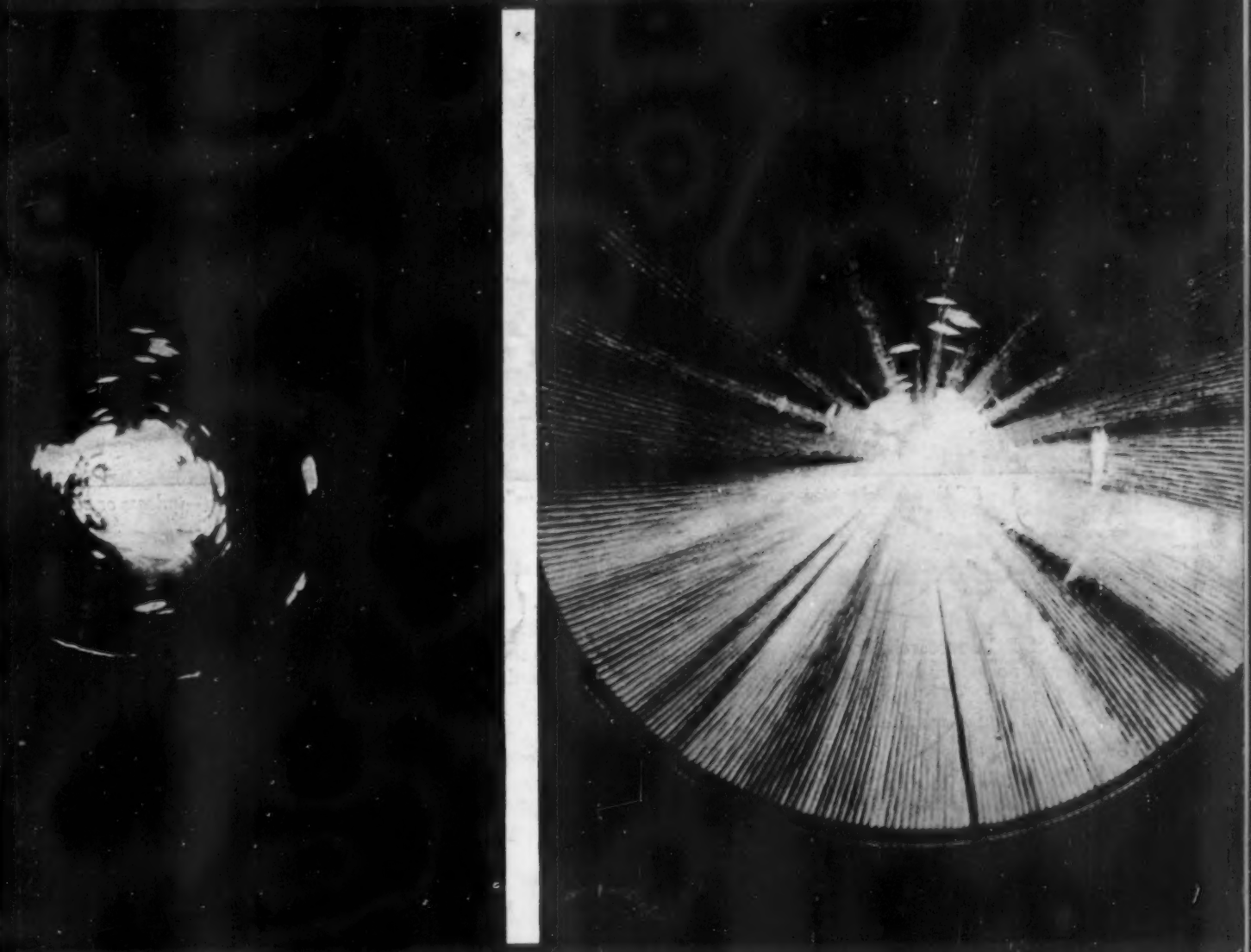
THE WEEKLY SUMMARY OF CURRENT SCIENCE · DECEMBER 8, 1945



## Interference

See Page 355

A SCIENCE SERVICE PUBLICATION

*RCA's new television camera has a super-sensitive "eye" that sees even in the dimmest light—indoors or outdoors.*

## *A television camera "with the eyes of a cat"*

As a result of RCA research, television broadcasts will no longer be confined to brilliantly illuminated special studios—nor will outdoor events fade as the afternoon sun goes down.

For RCA Laboratories has perfected a new television camera tube, known as Image Orthicon. This tube, a hundred times more sensitive than other electronic "eyes," can pick up scenes lit by candlelight, or by the light of a single match!

This super-sensitive camera opens new fields for television. Operas, plays, ballets will be televised from their original performances in the darkened theater. Outdoor events will remain sharp and clear on your television set—until the very end! Television now can go places it could never go before.

From such research come the latest advances in radio, television, recording—all branches of electronics. RCA Laboratories is your assurance that when you buy any RCA product you become the owner of one of the finest instruments of its kind that science has achieved.

Radio Corporation of America, RCA Building, Radio City, New York 20. *Listen to The RCA Show, Sundays, 4:30 P. M., Eastern Time, over NBC.*

**RCA Victor television receivers** with clear, bright screens will reproduce every detail picked up by the RCA super-sensitive television camera. Lots of treats are in store for you. Even today, hundreds of people around New York enjoy regular weekly boxing bouts and other events over NBC's television station WNBT.

RCA **RADIO CORPORATION of AMERICA**

ELECTRONICS

# Counter-Radar Devices

**Aluminum foil scattered in the air and electronic jamming both successful anti-radar devices. Our pilots also knew when they were being hunted.**

**See Front Cover**

➤ FIRST CAME radar—then radar countermeasures. Enemy radar had to be killed during the war as well as enemy industrial production and gunfire. How the effectiveness of German and Japanese radar was destroyed by the Allies was revealed to a group of science writers at the Harvard Radio Research Laboratory and demonstrated at the Bedford Army airfield. A little information about the use of aluminum foil had already been made public, but the full story of the various radar countermeasures developed had been untold until then.

Radar countermeasures include anti-radar devices, which are jamming systems that interfere with radar echo. Most of the scientific work in developing radar countermeasures was done at the Harvard Radio Laboratory, a wartime institution under Division 15 of the National Defense Research Committee, and was financed by government funds through the Office of Scientific Research and Development.

Radar installations were the "eyes" of the enemy as well as of the Allies. Approaching planes, surface vessels, submarines and other machines of war were detected and located by radar. Radar was also used to locate production plants, shipping piers, bridges and other structures playing active parts in warfare. Radar not only detected approaching warcraft, but automatically aimed anti-aircraft and other guns at them. Successful anti-radar devices were a number one war essential.

When the Allied radar jamming system was first sprung on the Germans in 1943, it threw their defenses into utter confusion and decreased by 75% the effectiveness of their anti-aircraft guns. In the last days of the wars, both in Europe and the Pacific, the Allied anti-radar devices had made such a boomerang of German and Japanese radar that they often gave up using radar lest it betray them. The photograph on the cover of this SCIENCE NEWS LETTER shows the appearance of typical "PPI" radar scope unjammed, left, and on the right the appearance when partly jammed. When completely jammed, all planes are entirely obliterated. The isolated light spots in the unjammed picture represent targets or objects at different distances and directions.

Anti-radar devices were of two general types: aluminum foil called "window" or "shaff," and electronic detectors and jammers. The use of the foil became known to many during the war, but the extent of its use was revealed for the first time at the demonstration. Approximately 20,000,000 pounds of aluminum foil was dropped in Europe alone. Cigarettes and candy bars in the United States were without aluminum wrappings because the entire production of foil was needed for window.

Aluminum foil is an excellent radio reflector and it returns a relatively strong radar echo in proportion to its size. What made it particularly valuable as window, however, was a discovery made by the scientists that its effectiveness is greatly increased when the strips were cut to one-half the radar's wavelength. These "tuned" strips send back a strong echo.

The thin strips of aluminum used are only a tiny fraction of an inch wide and a few inches long. A bundle of 6,000 strips weighs six ounces. A single bundle dropped from a plane, scattering in the air, looks to a radar like three heavy bombers. The science writers watched the scope of a radar in a darkened room while this electronic "smoke screen," or window trail, was distributed by three planes. Following planes in the trail failed to record on the scope, even a half-hour later.

Electronic jammers operate on the simple principle of radio interference, similar to the interference with which most home radio users are familiar when they receive two broadcasts from two stations on the same wavelength. The jammers attacked enemy radar receivers with radio waves from planes modulated by random "noise," which drowned out any audible radio echoes from the radar's target and obliterated all signs of the target from the radar's screen, or scope.

A radar can be jammed, Radio Laboratory scientists explained, only by waves of the same wavelength or frequency. Therefore a basic instrument in radar countermeasures is an electronic detector called the "search receiver" which can be tuned to intercept a radar signal and determine its frequency.

When equipped with directional antenna, this receiver can locate an enemy radar set. These direction-finding receivers have a much greater range than radar itself, and for this reason often proved

***STOPPED RADAR—A handful of the aluminum foil which was scattered in the air to blot out radar echo. Photograph by Fremont Davis, Science Service staff photographer.***

better than radar for locating the enemy. A radar-hunting operator could locate an enemy radar station long before the radar could locate him.

During the latter part of the war, United States planes and surface vessels often knew by use of these direction-finding receivers when they were being hunted by enemy radar, and they often detected and pounced on the hunters before the enemy radar discovered them. German submarines, they said, eventually stopped using radar to avoid detection by these receivers.

*Science News Letter, December 8, 1945*

ELECTRONICS

# Anti-Radar Station

**Powerful land-based jammer in England blinded German planes following English bombers homeward. Key of device is American special vacuum tube.**

➤ IN ADDITION to aluminum foil and air-borne electronic devices to blind or jam enemy radar searching for Allied air and surface warcraft, there was also the ingenious land-base radar countermeasure device known as "Tuba." Information concerning it has been released by the Joint Board on Scientific Information Policy for the Office of Scientific Research and Development and the War and Navy departments.

Tuba was a tremendously powerful jamming transmitter developed for use against German night fighters. In 1942 the Germans were taking a heavy toll of British night bombers, using an airborne interception radar known as "Lichtenstein" for close-range location of their targets.

Against them, the report states, the British found it impractical to use jammers carried in their bombers, because the jammer itself provided a signal which German fighters could use to locate the bomber. A radio signal, including a jamming one, betrays the direction from which it comes, and even though a jammer might blot out a German scope, making it impossible to find the range, the German could find the bomber simply by following the signal.

To meet this problem the idea was conceived of developing a very highpowered jammer in England to blind the German fighters' radar as they flew toward it in pursuit of the homeward-bound bombers. A jammer of this sort obviously would require power a thousand times greater than any previously attained in the frequency range of operations involved, which in itself was 10 times higher than that used for frequency modulation and television.

The problem was solved by the development of a very remarkable vacuum tube developed in the United States, known as the "resnatron." It was necessary to build a resnatron that would be tunable over a wide frequency range because the Germans could change the frequency of their radars by slight modifications. Also it was necessary to find a way to modulate the resnatron's output with the random "noise" necessary for jamming. Both objectives were accomplished, and by January, 1944, a workable instrument had passed its tests.

By June, 1944, the complete jamming system was in operation against the enemy. Its power was comparable with the most powerful United States broadcasting station (50,000 watts), yet the frequency of operation was 500 times as high.

*Science News Letter, December 8, 1945*

AERONAUTICS

## Transoceanic Flying Failures Greatly Reduced

➤ TRANSOCEANIC flying has now advanced to the point where commercial operations may be conducted with flight failures approaching zero, declared Frank R. Canney of Boeing Aircraft Company at the national air transport engineering meeting of the Society of Automotive Engineers in Chicago. He estimated the probable frequency of emergency landings, or "ditchings," on the New York-London flight currently as about one in 16,576 flights.

Mr. Canney cited wartime flying records to prove his point. He reported that total AAF B-29 operations during the war, including combat flying, resulted in only one "ditching" for each 750,000 miles flown.

Increased cruising speeds, improved engine performance, and the operating policy of adopting alternate flight plans whenever trouble begins to develop, make the chances of emergency landings low, he said. Transoceanic flying safety is enhanced, he continued, by use of weatherproofed aircraft equipped with pressured cabins, four supercharged engines, and radio communication.

Flying altitudes of 15,000 to 35,000 feet, he added, enable planes to take advantage of the most favorable winds. Flying speeds of 200 to 400 miles an hour make crossings so brief as to minimize chances of mechanical failures. Engineering requirements for overwater flying differ little, Mr. Canney stated, from those of overland routes.

*Science News Letter, December 8, 1945*

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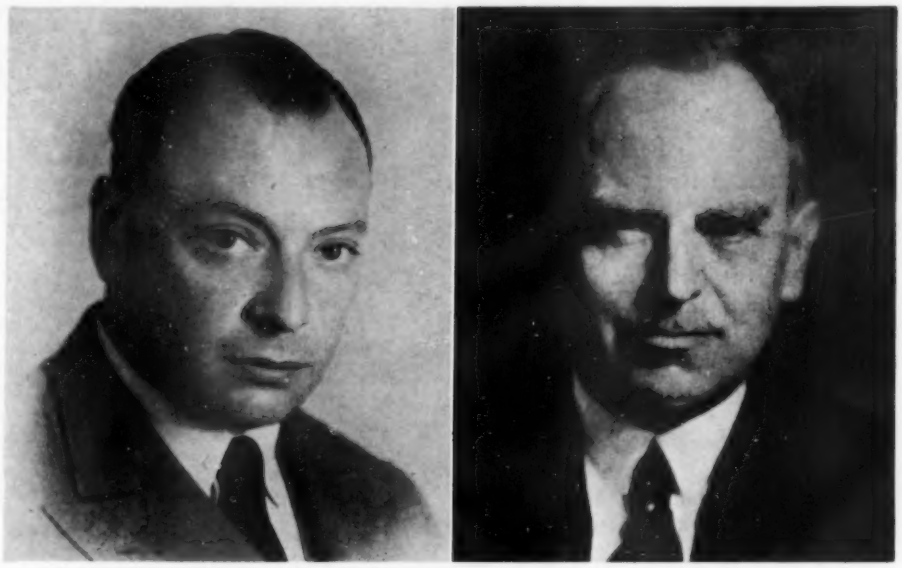

*NOBEL WINNERS—Prof. Wolfgang Pauli, left, was awarded the 1945 physics award for theoretical studies on atomic structure and Prof. Otto Hahn, right, the 1944 chemistry award for his fission of the uranium atom.* *(See SNL, Dec. 1)*

CHEMISTRY

# Synthetic Fuel Methods

**American fuel chemists have uncovered a German manufacturing process; valuable information obtained to assist our industry.**

➤ AMERICAN fuel chemists, members of a government technical mission to Germany, uncovered German synthetic fuel manufacturing methods and brought back to this country information of value on how the Nazis kept fighting equipment in operation with little natural oil available. The methods are applicable in this country.

A preliminary report on the findings of the American chemists was given by Dr. W. C. Schroeder of the U. S. Bureau of Mines, before the meeting of the American Society of Mechanical Engineers in New York. Full reports will be available later when other members of the mission have completed summaries of their findings. They will contain, Dr. Schroeder stated, "the best ideas generated through the years of research that the Germans spent on the synthetic oil industry."

The group of scientists went to Europe in March, 1945, about three months before V-E day, and remained to study synthetic oil plants in Germany as rapidly as they were seized by the Allies. Most of them had been knocked out by the Allied air forces but the debris was carefully studied.

"The examination was a tiring job of climbing over bricks, rubble, tanks and destroyed stairways," Dr. Schroeder declares.

Additional information was obtained from scientists of France, Belgium and the Netherlands who were in a position to know something of the German methods.

Allied bombing raids put the Nazi fuel oil and petrol plants practically out of business, Dr. Schroeder explained, forcing others underground.

"Toward the end of the war, the demand for oil became so great that the Germans were frantic to increase production by any means," he said, "and 10 Meiler plants were ordered constructed. They were to be finished within a few weeks. The Allied advance was so rapid, however, that only four operated and these for less than a month. A fifth was ready but was never operated."

Some of the plants in Germany were of "tremendous size," and blending formulas, the amount of tetraethyl lead to be used in aviation gasoline or additives for lubricating oil were all specified in Berlin, he stated. In this way, "the make-up of the finished product was known only to a limited number high in the Nazi inner circle," he stressed.

"German synthetic production reached a peak of somewhat over 350,000 metric tons per month in 1944," Dr. Schroeder stated. "About the middle of that year, bombings became severe and production dropped rapidly. During bad weather, which forced reductions in bombing operations, production again picked up until the last month of 1944. Bombing again increased in intensity, and toward the end of the war synthetic production became practically insignificant."

*Science News Letter, December 8, 1945*

PLANT PATHOLOGY

## Graft Method Fails; Tomatoes Are Poisonous

➤ ONE BEST-LAID plan of scientists to outwit a crop-ruining plant disease has gone agley because of uncooperative behavior on the part of one of the plants involved.

Tomato roots are often attacked by a parasitic worm known as a nematode, which produces a deformity called root knot and causes heavy losses in yield. A disreputable botanical second cousin of the tomato, the foul-smelling, poisonous jimsonweed, is immune to nematode attacks.

It occurred to a cooperating group of scientists, of the U. S. Department of Agriculture and the Alabama Agricultural Experiment Station, to try grafting tomato plants on these immune jimsonweed roots. The grafts "took" all right, and the plants bore tomatoes—but the tomatoes contained poison formed in the weed roots that fed them. Tomato-eating rabbits, caught in the act in the experimental plots, had become so intoxicated that they bumped into plant stalks and even against the legs of their pursuers.

The scientists haven't quite given up. It was noticed that some of the tomatoes from the grafted plants contained less of the jimsonweed poison than others. It may be that a tomato strain can be found that will not accept the poison from the jimsonweed roots, or that a less-poisonous variety of jimsonweed will turn up. But unless and until that happens, nematode root knot will have to be fought along other lines.

*Science News Letter, December 8, 1945*

MEDICINE

# Medical Reforms

**Correction of X-ray film situation and hormone treatment advised. Fight urged for animal experimentation, study of marihuana problem recommended.**

➤ CORRECTION of the X-ray film situation which causes needless expense and trouble to many patients is among a number of reforms advised by Dr. Herman L. Kretschmer, of Chicago, president of the American Medical Association, at the opening session of the association's house of delegates.

Dr. Kretschmer believes that when a patient has recently had a satisfactory set of X-ray pictures made at one hospital or by one roentgenologist, he should be able to get the films when he consults another physician who wants X-ray pictures to help in diagnosis. Too often at present, hospitals and roentgenologists or other physicians refuse to release the films and the patient is put to the expense and trouble of having another set made.

The present "fad" of considering every obscure complaint as due to endocrine gland disturbance and treating it with hormones is another situation that needs correction, Dr. Kretschmer advised the medical association's policy-making body. He praised highly the various scientists responsible for advancing knowledge of the glands and their disorders, but warned against turning the use of hormones into "another vitamin-like fiasco."

The hormone-conscious public, he stated, should be protected by physicians from the danger of misuse of hormones and by advertisers, health columnists and scientific writers for the lay press from wrong information about hormones.

The marihuana problem, "acutely before the nation today," should be investigated by the American Medical Association, Dr. Kretschmer advised, so that authoritative facts about this drug become known.

Medicine should take the offensive and get laws passed enabling medical scientists to perform experiments on animals rather than forever remaining on the defensive against the attacks of anti-vivisectionists, Dr. Kretschmer urged. Both man and animals benefit from animal experimentation, he declared. The public needs to know the facts of the situation and county medical societies should take the lead on this, he added.

County medical societies themselves were told by the A. M. A. president that they should enlarge or expand their scientific meetings and hold some for the lay public at which timely educational topics could be discussed.

Positive action on the deferment of medical and premedical students from service in the armed forces should be taken by the association which, Dr. Kretschmer declared, should demand that a situation of "confusion and chaos" should not be permitted to arise again.

He reiterated the association's stand against "regimentation of medicine" by which, though not specifically mentioning it, he apparently referred to proposed legislation for compulsory health insurance.

*Science News Letter, December 8, 1945*

***FOR THE RECORDS—Here is one of the pictures in a play by play story of an amputation operation photographed by the new clinical camera developed by the Pictorial Engineering and Research Laboratory of the Signal Corps Photographic Center as a joint project of the Signal Corps Army Pictorial Service and the Surgeon General's office. (See SNL, Nov. 24)***

AERONAUTICS-METEOROLOGY

# Fly Regardless of Weather

**Independence of atmospheric conditions predicted for commercial aircraft. With radar and de-icing devices, flights may be completed 99% of the time.**

➤ "PRACTICALLY independent of the weather" is the forecast for commercial airplanes of the future, according to Dr. C. C. Furnas, director of research for the airplane division of Curtiss-Wright Corporation of Buffalo. He foresees completion of flights 99% of the time, as compared with the present average of 91%. The prediction was made at a recent meeting of the American Society of Mechanical Engineers in New York.

"Adaptation of the various devices of radar to the development of very reliable blind landing systems, coupled with heat de-icing for wings and propellers, should in the near future bring us to the point where commercial aircraft flights can be completed 99% of the time as contrasted to the present 91%," Dr. Furnas said. "This will make a tremendous difference in the confidence which the traveling public will have in aviation, and hence will greatly increase the number of potential passengers."

"Phenomenal changes" in commercial aircraft should not be expected in the near future, he indicated, but there will be a steady improvement to bring the newer things in aviation to the public.

"The focus of attention of most research work in commercial aircraft," Dr. Furnas stated, "is on speed, safety, comfort and reliability. Aero-dynamic constructional research will make significant contributions, but it is anticipated that the developments which will be most evident to the public will be in safety, comfort and reliability."

The average speed of airliners will be from 225 to 300 miles an hour, he ex-

pects. This is in comparison to 180 miles an hour, a speed now quite common. The bulk of the air travel in the United States about a year from now will be carried in planes of from 40- to 60-passenger capacity, with a few of 100-passenger capacity. It is not expected, he said, that any of the super-sized airplanes will be in use for some time.

*Science News Letter, December 8, 1945*

ENGINEERING

# Disabled Are No Problem

**Physically impaired workers present no employment problem to industry if definite program of fitting man to job is followed.**

➤ PHYSICALLY impaired workers, whether returned veterans or others, present no employment problem to industry if management follows a definite program of fitting the man to the job, declared John V. Grimaldi, research engineer, National Conservation Bureau, New York, at the meeting of the American Society of Mechanical Engineers in New York. Fitting the job to the man is frowned on in the modern selective placement program and "only should be considered as a last resort," he said.

Mr. Grimaldi is a research engineer in the Association of Casualty and Surety Executives in its national conservation bureau. The successful placement of the physically impaired depends primarily on good personnel or management planning, he emphasized.

"Before one can recognize fully the employment equality between the impaired and the normal worker, he must cleanse his thinking of any misconception concerning the impaired," he stated. "He must be able to look at a noticeably impaired worker objectively and remember that a twisted, deformed or lame body may be equipped, for example, with a fine mind or be capable of extreme dactyl dexterity. An impaired person may have any grouping of a number of outstanding abilities.

"It is generally our unfamiliarity with severe impairments that corrupts our thinking," he explained, "so that we evaluate the impaired solely in terms of the deficiencies we see. It would be more appropriate if we regarded such workers not as physically disabled, but as physically exceptional."

The program for the successful placing of impaired workers, Mr. Grimaldi outlined, should contain a definite company policy on rehabilitation, analysis of jobs with special reference to disabled workers, medical determination of an applicant's physical capabilities, matching men to the job, job training, and periodic review of such placements.

## $12,000,000,000 Business

➤ OPERATIONS of the Army Ordnance Field Service, storing and supplying to the Army the materiel of war, compares in scope with both the wholesale and retail functions of a vertically organized concern manufacturing $12,000,000,000 worth of goods a year and distributing in both domestic and foreign markets, declared Brig. Gen. E. E. MacMorland at the same meeting.

Vital to the system, he said, were 53 storage depots covering 285,000 acres and employing 100,000 workers. Despite these storage facilities, during the last stages of the war some 35% of the total tonnage of ordnance supplies were shipped directly from manufacturing plants to ports, he said.

*Science News Letter, December 8, 1945*

***SPEEDY CAMERA**—Maj. Gen. Norman T. Kirk, Surgeon General, U. S. Army, and Brig. Gen. Edward L. Munson, Jr., Signal Corps, inspect the new speedy camera for medical photographs. Every phase of the picture-taking except focusing and clicking the shutter is automatic. (See SNL, Nov. 24)*

ENGINEERING

## Electric Finger Guides Machine Tools in Cutting

➤ WHAT MIGHT be turned an electric finger, designed to guide machine tools in the cutting of dies and other metal articles at once intricate in shape and precise in dimensions, is the invention on which patent 2,389,594 has been issued to a trio of inventors, S. H. Caldwell of Belmont, Mass., J. J. Jaeger of Cambridge, Mass., and Richard Taylor of Great Neck, N. Y.

A pointed metal rod or stylus slides over the contours of pattern or template. Metal masses connected with its shank move through hollow electromagnets. Every lateral or longitudinal deviation of the finger thus results in a change in one or more magnetic fields, and these changes, suitably relayed, control the action of electric motors that in turn guide the cutting tools.

Patent rights have been assigned to the Niles-Bement-Pond Company of Hartford, Conn.

*Science News Letter, December 8, 1945*

ASTRONOMY

## Bright Comet Found In Constellation Corona

➤ A BRIGHT comet was found the evening of Nov. 22 in the constellation of Corona, the northern crown, by an amateur astronomer, Clarence L. Friend, of Escondido, Calif., according to a telegraphic report to Science Service.

The comet was comparatively bright, being of the seventh magnitude, just too faint to be seen with the naked eye.

Because of its brightness, this comet is probably not a periodic comet, although a few faint ones are due about this time.

The seventh magnitude comet was independently located by another amateur astronomer, Leslie C. Peltier of Delphos, Ohio. Both amateurs are credited with discovering several comets. Plates taken the evening of Nov. 24 at the Harvard Observatory confirm the existence of this bright heavenly traveler.

Comet Friend, when located on Nov. 22, had a right ascension of 16 hours, 20 minutes, and a declination of 30 degrees north. Located in the constellation of Corona, the northern crown, it now has moved to the constellation of Hercules.

The comet was moving slowly toward the sun, and could be seen only shortly before sunrise and just after sunset.

*Science News Letter, December 8, 1945*

SEISMOLOGY

## Severe Earthquake Had Epicenter in Oman Gulf

➤ THE VERY SEVERE earthquake in southwestern Asia, of which only fragmentary reports have been filtering into the news, had its epicenter under the Gulf of Oman, between the southeastern corner of Iran and the opposite corner of the Arabian peninsula. This is the body of water where Sindbad the Sailor had many of his troubles. An earthquake between its confining shores could easily enough have launched a tidal wave that would be felt at Bombay, and Karachi, India, on the opposite side of the Arabian Sea; nearer shores may have been even more heavily battered.

Approximate location of the epicenter was determined by seismologists of the U. S. Coast and Geodetic Survey only after reports had been gathered by Science Service from a wide network of observatories, all the way from Massachusetts to Australia and from Alaska to New Zealand.

The provisional "fix" places the epicenter somewhere in the neighborhood of latitude 23 degrees north, longitude 60 degrees east. Time of origin was 4:56.9 p.m., EST, on Nov. 27, or 1:56.9 a.m., local time, on Nov. 28.

Overseas seismological stations reporting were those of Riverview College, Sydney, N.S.W., Australia; the Dominion Observatory, Wellington, New Zealand, and the U. S. Coast and Geodetic Survey observatory on the campus of the University of Hawaii at Honolulu. North American stations were those of the California Institute of Technology at Pasadena; the Jesuit Seismological Association at Georgetown University, Weston College in Massachusetts, and Spring Hill College near Mobile, Ala.; and the U. S. Coast and Geodetic Survey stations at Sitka and College, Alaska, and Tucson, Ariz.

*Science News Letter, December 8, 1945*

TECHNOLOGY

## Shells of Hen's Eggs Are Like Those of Dinosaur

➤ SHELLS of eggs laid by barnyard hens today have the same crystalline structure as those laid by giant ostriches 100,000 years ago and those laid by dinosaurs approximately 100,000,000 years before our time.

That evolution throughout the centuries has had little effect on eggshells is demonstrated by X-ray diffraction patterns made by Prof. Bertram E. Warren of the Massachusetts Institute of Technology. Diffraction patterns tell more about crystals than chemical analyses because the same chemical compound may have several different crystalline forms.

The position and relative intensities of the diffraction lines, characteristic of the particular crystal structure, are used to identify crystals, just as fingerprints identify individuals, reports *Technology Review*. The diffraction pattern is made by sending a beam of X-rays through a small lump of pulverized shell. Each plane of the crystal separates the rays into a cone of light. These cones, striking the photographic film, produce the pattern, which is symmetrical about its center.

The giant ostrich and dinosaur eggshells have the same calcite structure as Iceland spar and chalk whiting. The same calcite form of crystal also was found in oystershells and lobster claws.

*Science News Letter, December 8, 1945*

# IN SCIEN

CHEMISTRY-ZOOLOGY

## DDT Found Poisonous To Minute Crustacean

➤ USE OF DDT to kill mosquito larvae in ponds and streams may result indirectly in reducing the fish catch, it is indicated by experiments of Prof. Bertil G. Anderson of the Franz Theodore Stone Laboratory of Ohio State University and of West Virginia University.

Prof. Anderson's experiments were on Daphnia, often called water-flea, an almost microscopic crustacean, distantly related to lobsters and crabs. Despite its minute size, Daphnia is important to fresh-water fisheries because it swarms in immense numbers, is eaten by small fish, which in turn are eaten by larger game fish such as bass and pickerel.

"It was found," Prof. Anderson reports, "in all but one instance, that 50% of the Daphnia were immobilized by concentrations of over one part per billion in 32 hours or less. Concentrations from one to one hundred parts per billion immobilized the animals in periods between 16 and 32 hours. Animals in concentrations of less than one part per billion survived as long as the controls in Lake Erie water alone. Some experiments were run as long as 130 hours.

"These results may be of significance in relation to using DDT for mosquito control, since in many localities it is essential that the zooplankton be protected."

*Science News Letter, December 8, 1945*

PHYSICS

## Hundred Million Volt "Atom Smasher" Proposed

➤ A NEW kind of "atom-smasher" in the form of an electron accelerator which could be built more cheaply and efficiently than the betatron to produce electron streams of more than 100,000,000 volts was described to the American Physical Society in St. Louis, by Dr. J. R. Woodyard of Purdue University.

The proposed apparatus is a cavity resonator consisting of a long cylinder oscillating in a high order longitudinal electric mode. Its resonator would be driven in short bursts instead of continuously to reduce power requirements.

*Science News Letter, December 8, 1945*

# E FIELDS

HORTICULTURE

## "Peace" Rose Chosen as All-America Selection

➤ "PEACE," a gorgeous new rose variety, has been named as the All-America rose selection for 1946 by a committee representing a group of seed and flower trade associations. Its flowers are described as starting with big yellow buds that open into unusually large blossoms with pink edges on their petals and a pink flush suffusing the general yellow hue. Later in summer the yellow turns to a creamy or alabaster white.

"Peace" is a plant of robust growth, as anything bearing that name needs to be in these uncertain days. The stems are long and stout, the leaves large, dark-green, strong-textured and resistant to fungus diseases.

The new rose was originated in France by Francis Meilland. A few plants were started in this country, and official trials were carried on during the course of the war. The stock has now been increased to a point where general distribution has become possible.

Other All-America selections for 1946 include several new petunia varieties and a new snap bean named Longreen.

*Science News Letter, December 8, 1945*

GENERAL SCIENCE

## Selective Service Policy Would Defer Scientists

➤ SCIENTISTS and students of science and engineering are now able to secure draft deferment in order to resume or continue their work, according to information obtained from Selective Service by Benjamin Wermiel, official of the National Roster of Scientific and Specialized Personnel.

A memorandum has gone out from Selective Service Headquarters to local boards telling them that individuals should now be considered for deferment for four different classes of reasons.

1. Graduate students may, under the new policy, continue their training for graduate degrees in science or engineering.

2. Individuals may be deferred so that they may teach science or engineering. This will help in handling the problem of the training of returning veterans.

3. Individuals may be deferred so that they may teach and do research at a university in science or engineering.

4. Undergraduate students in science or engineering may go back to college to complete their work for a bachelor's degree provided they have completed their junior year and have contributed two years or more of research to the war effort.

This new policy of Selective Service is expected to help greatly to relieve the critical shortage of scientists revealed by Dr. Vannevar Bush in his report last July to the President, as director of the Office of Scientific Research and Development.

*Science News Letter, December 8, 1945*

CHEMISTRY

## Oil-Cracking Catalyst Formed in Tiny Balls

➤ TINY BALLS instead of tiny doughnut-shaped particles resulted from dropping a solution containing a new oil-cracking catalyst down a 200-foot elevator shaft in Chicago. The experiment was performed to find a way of making spherical particles of the catalyst instead of the usual ring-like particles resulting from other methods.

High-octane gasoline is made by cracking petroleum oils with a catalyst, a substance that has a chemical effect on the oils but does not itself undergo change. It is used over and over again, however, and finally wears away to dust. Tons are used annually, therefore the loss is appreciable.

The experiment was carried out by scientists of the Standard Oil Company of Indiana. One method of preparing a new catalyst studied by them is to spray it as a solution into a tower and then collect the fine solid particles at the bottom. Under a microscope, these particles are found to be tiny rings or doughnuts. The scientists knew that these ring-shaped particles would wear out more rapidly than spherical particles would.

The experiment in the elevator tower was a success; the particles resulting were tiny balls. The scientists are not certain that a 200-foot tower will be required, however, but think that perhaps spherical particles can be obtained by a lesser drop provided an upward current of warm air is used to dry the particles quickly.

*Science News Letter, December 8, 1945*

INVENTION

## Power-Driven Chute For Unloading Coal

➤ COAL DELIVERIES, though anxiously sought, are frequently terrible nuisances when they finally come: the dirty black mountain, dumped unceremoniously on the sidewalk, being shovelled down the coal-hole or lugged in, a basket a time, on the shoulders of smudged and dusty laborers, is a too-familiar experience.

To obviate all this is the objective of a new power-driven conveyor chute, on which U. S. patent 2,389,779 has been granted to Eugene H. Heller of Arlington Heights, Ill. To make his chute rugged enough for its job, Mr. Heller has built it rather heavy. To make it maneuverable he has provided a pair of retractile wheels, on which it may be trundled to and from its carrying position on one side of the truck body. Once it is wheeled into unloading position, the drive pulley of its conveyor belt is hooked onto a power takeoff from the truck's motor, which will keep the coal moving rapidly through the chute when the end-gate is opened and it pours into the receiving hopper.

*Science News Letter, December 8, 1945*

PHYSICS

## Stereophon System Now Available to Public

➤ INFORMATION concerning a German system for sound recording on film, together with details and diagrams, has been made available to the American public by the U. S. Department of Commerce. It is known as the Stereophon system.

It was developed by a German physicist, Dr. Carlheinz Becker, who started work on it in 1938 and proceeded without Nazi interference until 1942. Then he was ordered to convert the system into an explosion power recorder, for which it was well suited in many respects.

The Stereophon system is reported as having the important advantage of giving excellent three-channel reproduction of dynamic range and low noise level with the use of sound track having a total width of only 2.65 millimeters. It has a signal frequency range of 23 to 10,000 cycles, and a dynamic range of 60 decibels without resort to expansion and compression.

*Science News Letter, December 8, 1945*

ECONOMICS

# Riches from Fishes

**Fine leathers, vitamin A, oil, fertilizer and stock food come from the ocean depths. 4,500,000,000 pounds of fish produced annually in the United States.**

By A. C. MONAHAN

➤ FINE LEATHERS for ladies' slippers, purses and belts may some day be obtained from ocean depths. Scaleless fish, such as catfish and sharks, have tough hides that before the war were used in wearing apparel, and soon may be used again. Improved tanning processes may give them a permanent place in the market.

Making leather from fish skin is just another step in the program of the commercial fishing industry which looks forward to the day when all former fish wastes will become valuable by-products. The industry wastes little now, hardly more than meat packers do of the cow or hog, but its goal is to use every bit of the fish for the products that will bring in the greatest financial returns. By-products mean the difference between profit and loss.

Commercial fishing is primarily for food, but some fisheries are interested in fish with little or no food value because of their value for oil, animal food and fertilizer. Some fish only for sharks to obtain the important vitamin A in their livers. But the rest of the shark is not wasted; it makes feed, fertilizer and leather.

### Large Industry

The American fishing industry produces annually an average of about 4,500,000,000 pounds of fish, oysters, shrimp and other seafood, of which two-thirds by weight reaches the market as foods for humans and one-third as by-products. In canning and filleting, much edible flesh is unusable for those particular purposes and becomes shredded fish-flakes or canned dog rations. Some 600,000,000 pounds of former waste becomes meal and oil. Even oyster and clam shells find a use in poultry yards or in manufacturing processes.

Fish has long been used for fertilizer. Fish meal is food for hogs and cattle as well as for chickens. Cod liver oil, from livers formerly discarded, is a valuable medicine in the treatment of diseases causing emaciation. The soupfin shark's liver is particularly rich in vitamin A, although today dog-shark liver is a greater source of this vitamin because the poundage taken is much greater. Fins of the soupfin shark bring a high price from Chinese on the West Coast who make a finely flavored gelatine from its delicate fin-rays.

The United States has ample fishing resources. This is fortunate because Americans are fisheaters. The per capita consumption is not as great as it is in England, Japan and other island countries, but might approach the British consumption if inland Americans ate as much as those living within a few hundred miles of the oceans.

Americans in the interior have greatly increased their use of salt water fish since they have been able to buy the so-called filleted product all ready to cook. The average housewife never did like the job of "cleaning" fish. Incidentally, filleting fish in factories saves for factory by-products vast quantities of former household wastes dumped into garbage cans.

One reason that America has ample fish is because the country has vast underwater continental shelves extending many miles from much of its coasts. Fish must have food.

The necessary food is found in the plant and animal life in the relatively shallow waters over these shelves, and not in the deep water of mid-ocean. Plankton grow in these offshore waters, and much food is carried to them by entering rivers. Insects, grubs, worms and mollusks are more abundant. Fish eggs are more plentiful, and, for fish that like to eat fish, small varieties and young fish are available.

The North Atlantic fishing region, historically well known, includes the New England coast and the Newfoundland banks. It has a broad continental shelf that extends in places hundreds of miles to the sea, with several banks or underwater plateaus. The region is the great home of the cod, sacred to Massachusetts, but is more abundant in haddock, flounders, pollock and rosefish. The New England coast is the home of the lobster, clam and scallop.

The Middle Atlantic states region is best known for its oysters, crabs, shad, alewives and striped bass. It is noted also for its menhaden fishing, a fish taken almost wholly for the fish oil and meal industry.

The South Atlantic area, which includes the Gulf of Mexico, is also noted for oysters, crabs, and menhaden. The Gulf is the seat of the largest shrimp fisheries in the world. Both Middle and South Atlantic regions produce many other edible fish. Florida offshore waters are the hunting grounds for the tarpon, the famous six-foot fighting gamester.

Sardines, or pilchard, constitute the principal landings in the South Pacific or California region, but the tuna is an important catch. It is taken mostly in waters south of the United States-Mexico line. More fish in volume is now landed annually in California ports than even in New England.

Unlike conditions of the North Atlantic coast, waters rich in food for fish in the Pacific are not confined to the continental shelf but extend many miles to sea.

### Salmon Area

The North Pacific fisheries region is off the coast of Oregon, Washington and British Columbia. It is a salmon area, with heavy production also of halibut, albacore, oysters, crabs, and sharks. It is the principal center of the shark-liver oil industry.

Alaska is one of the most important of the fishery resources of the United States and is noted particularly for its salmon. Salmon is America's most valuable fish catch, and about 90% of it comes from Alaska. Approximately 600,000,000 pounds of Pacific salmon are landed each year, 85% of which is canned. In addition to this commercial catch, millions of pounds are caught annually by sportsmen because salmon is a sport fish.

Salmon canneries use more of the fish than any other fish canning industry. On the other hand, they utilize less of the waste. Some of the roe reaches the market as caviar, and some of the fish waste is used for meal and oil, but the bulk is thrown away.

Inland waters furnish America with much fishfood. The commercial catch in the Great Lakes, the Mississippi and other lakes and rivers, excluding sea-

run fish, is in the neighborhood of 175,000,000 pounds a year. No estimate is possible of the amount taken by individuals either for the family food or for sport. These inland bodies of water individually contain rather small populations of fish, but they add up to a vast total.

In the Great Lakes, the lake herring is the most important in point of weight taken annually. It lives off shore, feeding on plankton and on mollusks, crayfish, insect larvae and fish eggs. It belongs to the same family as the famous whitefish for which the lakes are noted. Whitefish, often called the king of freshwater fish, has become severely depleted through wasteful fishing methods and inadequate protection. The annual catch now is only about one-fifth by weight of the catch of lake herring.

The annual commercial catch of fish runs from four to five billion pounds with a value to the fisherman of over $200,000,000. The American fishing industry produces some 3,000,000,000 pounds of food and 1,500,000,000 pounds of by-products. It provides annually over 27,000,000 gallons of ordinary fish oils and an average of 1,100,000 gallons of liver oils.

The American fishing industry employs over 65,000 regular fishermen working on vessels, row-boats or from the shore, and 60,000 others engaged part time in commercial fishing. In addition many thousands are employed in canning and other processing plants. The total capitalized value of United States fishery resources is estimated, by government authorities, as $5,855,000,000.

*Science News Letter, December 8, 1945*


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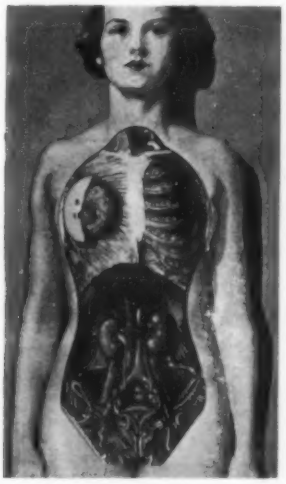

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| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |

*Signature*_____

*Address* _____

## Do You Know?

Brazil has begun the manufacture of *glass* for domestic needs.

The *cuma* is a large knife used extensively in crop cultivation in Salvador.

*Books* in the English language are in demand in Sweden.

*Calcium* in the soil is the most important element in influencing the development and growth of peanuts.

Soot-clogged *chimneys* are a serious fire hazard when the first hot furnace fires are started in the fall.

Liberal amounts of *vitamin A* tend to postpone aging and prolong life, certain scientists now say; their tests were made on rats.

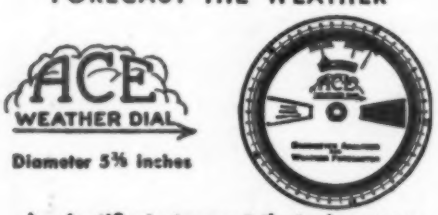
*Tin* was discovered in Yunnan, China, over 2,000 years ago but commercial mining was not begun until about 1,000 A.D.

*Grain* found in vases in ancient tombs is practically carbonized from age and will not sprout, in spite of numerous stories to the contrary.

*Cornstarch* ordinarily consists of two fractions, amylose and amylopectin, but a new variety of corn has been developed in which the starch is all amylopectin; it is a waxy maize and can be used as a substitute for tapioca.

Automobile *tires* built with rayon instead of cotton provide considerably greater wear because the rayon, although lighter, is stronger, and generates less heat because it creates less friction in flexing.

FORECAST THE WEATHER

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GENERAL SCIENCE

# ORG War Workers

**Chemists, physicists, mathematicians and other scientists did their fighting with test-tubes, oscilloscopes, slide-rules and brains.**

➤ WARTIME work of a scientific "silent service" in the Navy, more silent even than the submarines, has been partially disclosed. Chemists, physicists, mathematicians and other scientists of the Operations Research Group ("ORG" for short) did their fighting with test-tubes, oscilloscopes, slide-rules, many other kinds of scientific apparatus; but their chief weapons were their brains.

Their task was not so much the development of new weapons and ways of warfare—this was done by other groups of scientists—as the analysis of the tactics of using our new and secret weapons and the devising of countermeasures when our enemies sprang disagreeable new surprises.

Seventy-three scientists were recruited for ORG from a score or more of colleges, universities and research institutions, from the statistical departments of several insurance companies, from a few industrial firms, from government research laboratories, as well as from the Army and the Navy. Headquarters were in Washington, under the leadership of Prof. Philip M. Morse of the Massachusetts Institute of Technology. However, the tasks of ORG were far from being exclusively swivel-chair assignments. ORG men went out into the combat areas to check up on their own work. They flew in planes over enemy waters, they went on missions in submarines, they cruised in carriers that were attacked by Kamikaze flyers.

Some of the accomplishments of ORG, as listed by the Navy:

Trapping German submarines that were slipping into the Mediterranean through the Strait of Gibraltar.

Stopping German blockade runners carrying rubber, tin and other desperately needed war materials from Japan.

Devising an effective countermeasure to the deadly German acoustic homing torpedo, on which the Nazis had pinned their last hopes of winning the Battle of the Atlantic.

Drawing up a set of tables to enable anti-submarine craft to track down enemy submarines, even after hours of apparent escape.

Finding the "thin spots" in Japanese anti-aircraft defense, enabling our bombers to get in and attack with minimum losses.

Solving enemy methods of attack on our own submarines, thus cutting down our losses and increasing effectiveness of our attack.

The services of the Operations Research Group were furnished to the Navy by the Office of Scientific Research and Development, at first through a contract between Division 6 of the National Defense Research Committee and Columbia University, later through the Office of Field Service.

Institutions and organizations from which ORG drew scientific staff members were: Massachusetts Institute of Technology, Columbia, Harvard, Stanford, Northwestern, Notre Dame, McGill, Case, Antioch, Lawrence, Purdue, Kent, Iowa State; the Universities of California, Washington, Missouri, Michigan, Tennessee, and Oklahoma; the Rockefeller and Carnegie Institutes and the Institute of Gas Technology; the New York Public Library, the Equitable, Metropolitan, John Hancock, Sun Life, Union Labor Life, and Massachusetts Indemnity Insurance Companies; the Westinghouse Electric and Manufacturing Company, L. Bomberger and Company, and the American Thermos Bottle Company; the Insurance Department of Oregon; the State Department; National Bureau of Standards; Federal Communications Commission; the Army and the Navy.

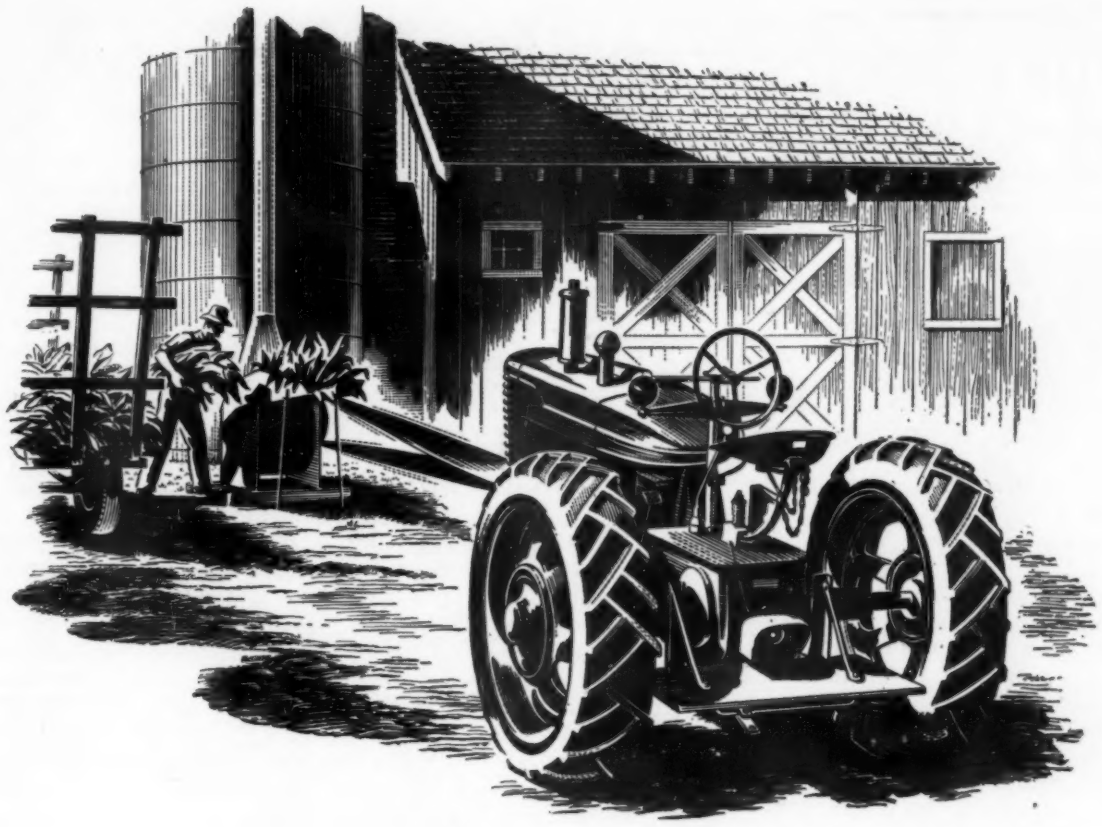
*Science News Letter, December 8, 1945*

NUTRITION

## Baked Potatoes Should Be Served at Once

➤ BAKED POTATOES should be served as soon as they are done, if you are to get the full benefit of their vitamin C. Potatoes that stood in the kitchen for half an hour after baking lost a third of their vitamin C, tests at the Illinois and Idaho Agricultural Experiment Stations indicate. Those that stood an hour lost 50%. All of the vitamin C was lost from baked potatoes allowed to stand for four hours.

*Science News Letter, December 8, 1945*



## HORSES THAT DO THE CHORES—AS WELL AS PLOW

TIME was when a farmer was glad to have a team of good horses to do his work. Today, in his tractor, the American farmer has anywhere from ten to forty horsepower.

And these "horses" can do a lot more than pull a plow or other field rig. They can grind feed, fill silos, saw wood, lift hay, clean barns and do dozens of other jobs. The modern tractor is really a portable power plant.

But tractors haven't always been so versatile. Only a little more than a decade ago, tractors were generally powered by cumbersome, hard-to-start, slow-moving engines burning kerosene or other low-grade fuels. Then the high compression principle, already developed in automobile and airplane engines, was adopted by the farm machinery industry.

Engines were redesigned to take advantage of gasoline, and great increases in the power and flexibility of tractors resulted . . . giving the farmer a ready, convenient source of power at all times. In this evolution of the present compact, inexpensive tractor the Ethyl Corporation was privileged to play a unique part—though we neither manufacture tractor engines nor refine gasoline.

Our product is the antiknock fluid used by practically all petroleum refiners to improve the antiknock quality of their gasoline. Higher octane gasoline, in turn, permits the building of more efficient engines. In order that the ultimate user of power—in this instance, the farmer—may realize the greatest benefit from antiknock fluid, our research engineers work with both engine builders and petroleum refiners in finding answers to the many complex problems of engines, fuels and lubricants. The modern high compression tractor was a direct product of such cooperative work.

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BOTANY

# NATURE RAMBLINGS

*by Frank Thone*

**Life in Winter**

➤ WINTER, we are accustomed to assume, is a time of frozen paralysis for plants in the snowy parts of the world. Leaves are gone from most of the trees, no flowers bloom; the short-lived herbs, that complete their lives, from seed to seed, between spring and fall, are all dead and withered. Poets of the more sentimental school have made great capital of winter as a time of desolation and death.

If we go and take a look for ourselves, however, instead of sitting by the fire and indulging in thanatopsian musings, we are likely to see a great deal more of life in the seeming-dead woods and fields than a superficial observer, going home in a shivering hurry, would ever suppose.

Evergreen trees—pines and spruces and firs and junipers—are of course obvious to everyone. So much so, indeed, that they have been taken as the symbols of hope and expectation of a springtime resurrection: that is the basis of our use of them for Christmas trees.

But down on the ground, among the dead leaves or even boldly taking the worst that winter has to offer right out in the open, are all kinds of smaller evergreen plants. Several species of fern (one of them even named Christmas fern), almost all the mosses, trailing arbutus, hepaticas, round-leaved harebell, scrambling vines like the catbriar, tough dwarf shrubs like bearberry, rosette-forming weeds like mullein and dandelion, and a hundred other hardy humble evergreens, keep their leaves all winter long.

*Science News Letter, December 8, 1945*

ELECTRONICS-AERONAUTICS

## Towering Walls of Light To Flank Landing Strip

➤ A NEW AIRFIELD runway lighting technique, involving the use of two towering walls of light flanking a landing strip, is planned for New York's new Idlewild municipal airport, it is reported. The sheets of light, extending high into the sky, will help planes to make safe landings in foggy weather. It is a scheme never before tried as a landing aid, it is claimed.

The new landing guide is so planned that the approaching pilot will see the runway as a dark area between twin sheets of controlled light that shoot upward without glaring into his eyes. The runway surface will be illuminated by smaller lamps, to the low surface brightness preferred by aviators.

"Each unit of the new system of landing lights will include 300-watt 'sealed beam' floodlight with a prismatic lens which will fan out light parallel to the runway," W. A. Pennow of Westinghouse Electric Corporation states. "The units will be spaced 200 feet apart according to present plans, with provisions for 100-foot spacings in the future. The fanning effect will create an interlocked 'wall' of light a short distance above the runway."

The floodlight unit will have a contact light mounted on the same base so that the walls of light can be used in bad weather and normal runway lighting in good visibility.

The new system was conceived by Adam Kopf, lighting expert of the office of Edward A. Sears, electrical consultants in New York. Mr. Kopf refers to the system as an "aisle of light." A similar curtain of light was used, he said, at a Long Island amphitheater to mask the stage from the audience. Westinghouse engineers transformed Mr. Kopf's idea into actual electrical fixtures for use on the runway.

*Science News Letter, December 8, 1945*

It is believed that *scurvy* did not afflict infants until bottle feeding was practiced.


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# • Books of the Week •

ATLAS OF SURGICAL APPROACHES TO BONES AND JOINTS—Toufick Nicola—*Macmillan,* 218 p., illus., $5. A systematic study with lucid illustrations by the author of the anatomical approaches to bones and joints. Foreword by Maj. Gen. Norman T. Kirk, Surgeon General of the U. S. Army.

BRITAIN AGAINST GERMANY, 1939-1945: A Record in Pictures—*British Information Service,* 127 p., illus., free. A review of Great Britain's own part in the victory over Germany and her European satellites.

DESTROYERS IN ACTION—Richard A. Shafter—*Cornell Maritime,* 246 p., illus., $2.50. Description of the many and varied ways in which destroyers are employed in wartime, plus many interesting items concerning their historical background.

EDUCATION IN CHILE—Cameron D. Ebaugh—*Gov't Printing Office,* 123 p., 25 cents. This booklet is part of a program to promote understanding of educational conditions in the American countries and to encourage cooperation in the field of Inter-American education.

THE ELEMENTS OF GLASS TECHNOLOGY FOR SCIENTIFIC GLASS BLOWERS—W. E. S. Turner—*Glass Delegacy of the University of Sheffield,* 31 p., 3/6.

ESSENTIALS OF NEURO-PSYCHIATRY—David M. Olkon, *Lea and Febiger,* 310 p., illus., $4.50. Presents the fundamental principles for the evaluation of mental disorders based on genetic, psychologic, psychiatric and general medical information.

FUN WITH ELECTRONS—Raymond F. Yates—*Appleton,* 157 p., illus., $2.75. A blueprint of electronics for any teen-ager who likes to see how and why things happen.

PETROLEUM PERIODICALS — Margaret M. Rocq, Elizabeth Nutting and Katherine Karpenstein—*Special Libraries,* 18 p., 10 cents.

THE PLACE OF SCIENCE IN THE EDUCATION OF THE CONSUMER—The National Science Teachers Association—*The Consumer Education Study,* 32 p., free. A statement prepared for the Consumer Education Study of the National Association of Secondary-School principals.

A PRIMER OF ELECTROCARDIOGRAPHY—George Burch—*Lea and Febiger,* 215 p., illus., $3.50. Enables the student who is entirely unfamilar with the subject to acquire fundamental knowledge of electrocardiography in the most direct manner.

THE SCRIPTA MATHEMATICA STUDIES: A Collection of Papers in Memory of Sir William Rowan Hamilton—*Scripta Mathematica,* 82 p., $1.50. Contains papers dealing with a number of important phases of Hamilton's life and scientific activity.

THIS IS SCIENCE—*Association for Childhood Education,* 43 p., 50 cents. Prepared to meet a widespread demand by teachers who wish to learn how the field of science may best be used to enrich the experiences of their pupils.

TOMORROW'S TRADE—Stuart Chase—*Twentieth Century Fund,* 156 p., $1. No. 5 in the series of guide lines to America's future.

*Science News Letter, December 8, 1945*

AERONAUTICS

# Flies 500 Miles an Hour

**The XP-47J, conventional propeller-driven plane has set a record which remains unbroken, it is revealed with removal of war secrecy.**

➤ FLYING over 500 miles per hour in level flight, the XP-47J, a conventional propeller-driven plane set a record which remains unbroken, the Air Technical Service Command revealed when war secrecy on this test was partially removed.

An experimental XP-47J underwent tests on Aug. 4, 1944, at Farmingdale, Long Island, before Army observers who watched it hurtle over 500 miles per hour through the skies, faster than any other conventional propeller-driven craft known. This speed was beyond that previously considered possible by aircraft experts for such type planes.

Designed and built by the Republic Aviation Corporation, the XP-47J was never produced beyond the experimental stage. Only one "J" was ever built because mass production would have required a complete retooling program. However, the experimental plane was an important development because its distinctive features and improvements were later incorporated in the P-47M Thunderbolts and finally the long range P-47N's. The army felt it wiser to continue production of the Thunderbolts at that late date than to begin a new program.

The XP-47J is similar to the thousands of early P-47D planes built up to that time. Its high rate of climb and tremendous speed made it an excellent interceptor fighter type. It has the same power plant later installed in the P-47N's, the Pratt and Whitney R-2800 C type engine, and a General Electric CH-5 turbo-supercharger. At a pressure altitude of 34,000 feet such features permit the development of 2800 horsepower under war emergency power conditions.

*Science News Letter, December 8, 1945*

EDUCATION

## Armed Forces Education Will Be Investigated

➤ EDUCATION as practiced in the armed forces during the war will be investigated by the American Council on Education under a Carnegie Corporation of New York grant, in order to find its implications for civilian education.

For this purpose $75,000 was appropriated as a part of the $1,002,500 of 1944-45 grants summarized in the annual report of President Devereux C. Josephs. Over half of the total was devoted to emergency war grants that normally would not fall into the Carnegie Corporation program. These included $225,000 to the American Red Cross and $150,000 to the National War Fund.

Another large grant was $75,000 to the Carnegie Foundation for the Advancement of Teaching for its graduate record examination project.

*Science News Letter, December 8, 1945*

One reason why *rayon tires* have superior strength is that rayon is produced in long, continuous strands while natural fibers are short and must be twisted together to form yarn.

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# •New Machines and Gadgets•

❁ *ELECTRONIC fish fence, to keep fish from escaping from hatcheries in outgoing waters, consists of one or more rows of metal electrodes through which electric impulses are sent to set up an electric field in the water. Fish entering the charged area receive an effective but harmless shock.*

*Science News Letter, December 8, 1945*

❁ *CARPENTER'S level is a long metal frame with parallel surfaces between which are inserted three rings, each holding two liquid vials similar to those in the ordinary level. Two of the vials are set at 45 degrees, two at plumb, and two at level.*

*Science News Letter, December 8, 1945*

❁ *MECHANICAL floor-scraper, to resurface concrete floors, resembles the ordinary hardwood floor renovator but has, on its horizontally revolving cutter, tips of cemented carbide, a relatively new metal alloy harder than steel. Embedded dirt and chips are quickly removed.*

*Science News Letter, December 8, 1945*

❁ *RUBBER heating pad, heated electrically without the use of wire coils, contains certain chemical compounds to make it conduct electric current throughout. It consumes less electricity than other heaters constructed with coiled wire.*

*Science News Letter, December 8, 1945*

❁ *WALNUT-SIZE fluorescent light bulbs have long-life and cost little to operate. They were developed as warning lights for use in homes, to mark*

*stairways and other dark places where mishaps in the dark might cause injury. The picture shows its soft light in a home nursery.*

*Science News Letter, December 8, 1945*

❁ *LABORATORY cabinet, operating with dry ice, is designed to satisfy all the cold-test conditions in present-day testing techniques, from minus 90 to 220 degrees Fahrenheit. Materials inside are visible through a window of multiple panes, being lighted with tiny fluorescent lamps.*

*Science News Letter, December 8, 1945*

❁ *LIGHT-WEIGHT boats, with hulls made in one piece of molded plastic plywood by the so-called Duramold process, are designed for sportsmen. The eight-foot dinghy can carry a load of 1,000 pounds.*

*Science News Letter, December 8, 1945*

❁ *COAL PLANER, a radically new type of coal mining machine used in German mines during the war, eliminates the costly tasks of cutting, drilling, blasting and loading. The plow-like machine shaves coal from an underground seam, working on the same principle as the carpenter's wood plane.*

*Science News Letter, December 8, 1945*

*If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 288.*


## BOOKS

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